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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
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| In the Matter of | ) | |
| | ) | Docket No. 50-454 |
| COMMONWEALTH EDISON COMPANY | ) | 50-455 |
| | ) | |
| (Byron Station, Units 1 and 2) | ) | |

COMMONWEALTH EDISON COMPANY'S
ANSWER TO THE NRC STAFF'S
MOTION FOR SUMMARY DISPOSITION
OF DAARE/SAFE CONTENTION 9c.

The NRC Staff, on June 4, 1982, moved, pursuant to 10 C.F.R. Section 2.749, for summary disposition of all of the admitted contentions of the DeKalb Area Alliance for Responsible Energy and Sinnisippi Alliance For The Environment (hereinafter referred to collectively as "DAARE/SAFE"). On June 7, 1982, Commonwealth Edison Company ("Applicant") filed a similar motion requesting summary disposition of all admitted DAARE/SAFE contentions except for 9c. concerning issues involving steam generator tube integrity.

Pursuant to section 2.749, any party may serve an answer supporting or opposing a motion for summary disposition. The Atomic Safety and Licensing Board



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("Licensing Board ") has extended Applicant's time to file such a response to noon, July 19, 1982. Applicant hereby submits its answer, supporting in part and objecting in part, to the NRC Staff's motion for summary disposition of DAARE/SAFE Contention 9c.

The following documents are submitted in support of Applicant's position with respect to DAARE/SAFE Contention 9c.:

1. Exhibit I, which sets forth (i) Contention 9c., (ii) Statement of Material Facts As To Which There Is No Genuine Issue To Be Heard, and (iii) Discussion of particular reasons why summary disposition is only partially appropriate on that contention;

2. Affidavits of Applicant's witnesses, Messrs. Malinowski and Burns in support of the various material facts set forth in Exhibit I; and

3. The depositions of NRC Staff witnesses, Messrs. Emmett Murphy and Jai Raj Rajan, dated July 7, 1982.

These documents demonstrate that there is no genuine issue as to any material fact with respect to Contention 9c. except, as explained in section C. of Exhibit I, for one issue, namely, the consideration of steam generator tube failure concurrent with other design basis accidents. In all other respects, the Licensing Board should grant the

NRC Staff's motion for summary disposition of Contention 9c. In the alternative, if the Licensing Board determines that it is unable to summarily dispose of the contention as indicated, Applicant respectfully requests that the Licensing Board enter a finding specifying the material fact or facts as to which there exist genuine issues requiring hearing.

Respectfully submitted,

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One of the Attorneys for the Applicant

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Dated: July 19, 1982

Exhibit I
To Applicant's Answer
To the NRC Staff's
Motion For Summary Disposition
of DAARE/SAFE Contention 9c.

A. Contention 9c.

> Steam generator tube integrity. In PWRs steam generator tube integrity is subject to diminution by corrosion, cracking, denting and fatigue cracks. This constitutes a hazard both during normal operation and under accident conditions. Primary loop stress corrosion cracks will, of course, lead to radioactivity leaks into the secondary loop and thereby out of the containment. A possible solution to this problem could involve redesign of the steam generator, but at FSAR, Section 10.3.5.3 the Applicant notes its intent to deal with this as a maintenance problem, which may not be an adequate response, given the instances noted in Contention 1, above.

B. Statement of Material Facts As To Which There Is No Genuine Issue To Be Heard.

1. Steam generators manufactured by Westinghouse for installation in nuclear power reactors have experienced various forms of steam generator tube degradation called intergranular corrosion, thinning, pitting, denting and wear. (Affidavit of Daniel D. Malinowski, p. 6, Answer to Question 8 (hereinafter referred to as "Malinowski Affidavit, p. ___, A. ___."))

2. Intergranular corrosion occurs either in the form of stress corrosion cracking or as intergranular attack. (Malinowski Affidavit, p. 7, A.9.)

3. Stress corrosion cracking and intergranular attack can occur on the outside surface of the steam generator tubes but these phenomena can be controlled by not allowing corrodents to accumulate in steam generators by applying vigorous water chemistry controls and/or several cleaning techniques, such as sludge lancing and hot and cold water soaks. (Malinowski Affidavit, pp. 7 and 11-12, A.9. and 14.)

4. The occurrence of stress corrosion cracking on the inside surface of the steam generator tubes can be controlled by limiting cold work techniques during tube fabrication or by reducing residual stresses by thermal treatment. (Malinowski Affidavit, pp. 7-8, A.9.)

5. Steam generator tube thinning is controlled by the use of All Volatile Treatment ("AVT") for water chemistry control. (Malinowski Affidavit, p. 8, A.10.)

6. Thinning has been noted in a minimal number of tubes in some plants using AVT; but the corrosion rate has not been excessive and the phenomenon is being closely monitored to understand and control it. (Malinowski Affidavit, pp. 8-9, A.10.)

7. Pitting of the steam generator tube surface has been observed in only one plant, and the phenomenon can be controlled by close adherence to water chemistry controls. (Malinowski Affidavit, p. 9, A.11.)

8. Denting of steam generator tubes results from the corrosion of the carbon steel support plates around the tubes, and it can be controlled by close adherence to water chemistry controls. (Malinowski Affidavit, pp. 9-10, A.12.)

9. Steam generator tube wear caused by impingement of loose parts and foreign objects can be effectively eliminated by the control of maintenance operations and through vigorous administrative procedures. (Malinowski Affidavit, pp. 10-11, A.13.)

10. Steam generator tube wear at anti-vibration bar locations due to flow-induced vibration has been resolved. (Malinowski Affidavit, p. 10, A.13.)

11. Various water chemistry guidelines are extremely important in controlling such corrosion mechanisms as denting, pitting, thinning and some forms of intergranular corrosion. (Malinowski Affidavit, pp. 11-12, A.14.)

12. Units 1 and 2 of Byron Station are equipped with Westinghouse model D4 and D5 steam generators respectively. (Malinowski Affidavit, pp. 4-5, A.6. and Affidavit of Edward M. Burns (hereinafter referred to as "Burns Affidavit, p. ___, A.___."))

13. The design of model D4 steam generators represents an improvement over earlier designs from the standpoint of diminishing the potential for tube corrosion. (Malinowski Affidavit, pp. 5-6, A.7.)

14. The D5 model is a design evolution from the D4 and it incorporates several design

improvements to reduce the potential for tube corrosion. (Id.)

15. Wear in steam generator tubes caused by flow-induced vibration has been recently observed in Westinghouse model D steam generators. (Malinowski Affidavit, p. 11, A.13., and Burns Affidavit, pp. 3-4, A.4.)

16. Tube vibration has been observed in the only nuclear power plant with model D4 steam generators; however, tube wear is less than that noted in plants with model D3 steam generators. (Burns Affidavit, pp. 4-5, A.5.)

17. No nuclear power plant with model D5 steam generators has yet operated; but tube vibration could occur because of the similarity of the D5 and D4 designs. (Id.)

18. Westinghouse is presently conducting a test program to evaluate the significance of the tube vibration phenomenon. (Burns Affidavit, pp. 5-7, A.6., 7. and 8.)

19. Westinghouse is considering several potential design modifications for the model D steam

generators; however, it has not been determined whether or not any modification will be necessary for the Byron Station steam generators. (Burns Affidavit, pp. 7-8, A.9. and 10.)

20. Westinghouse's evaluation is ongoing and the results of that evaluation should be available by February or March 1983. (Burns Affidavit, p. 8, A.11.)

21. The NRC Staff will review the results of Westinghouse's evaluation; and assuming a design modification is needed for the Byron Station, it could be installed from a few weeks' time to two or three months. (Burns Affidavit, pp. 8-9, A.12 and 13.)

C. <u>Discussion.</u>

Steam generator tube corrosion and wear mechanisms are generally understood; and measures, such as water chemistry guidelines and controls and cleaning techniques can be employed to control tube degradation. (Material Facts 1-10; and pp. C-9 and C-10 of Appendix C. to the NRC Staff's Safety Evaluation Report ("SER") related to the operation of Byron Station, Units 1 and 2.) One corrosion mechanism involving thinning has been observed at some nuclear power plants using AVT water chemistry, but its effect is minimal and the resolution of the issue is being pursued by Westinghouse (Material Fact 6).

A recent problem involving tube wear due to flow-induced tube vibration has been observed in model D steam generators (Material Facts 15-17). Westinghouse expects to have the results of their in-depth evaluation of the matter available by February or March 1983 (Material Facts 18-20), well in advance of the August 31, 1983 fuel load date for the Byron Station. (See "Motion of Applicant, Commonwealth Edison Company, To Strike Certain Contentions of the Rockford League of Women Voters and For Other Relief," p. 4.) Review and concurrence by the NRC Staff will follow; and if a design modification is needed at the Byron Station, it could be installed within four months (Material Fact 21). Assuming the results of Westinghouse's in-depth review are known in March 1983, Staff concurrence and any needed design modification could be accomplished prior to the August 31, 1983 fuel load date. If such were not the case, it is highly likely that the Staff, because of the large amount of information already available, would simply condition issuance of an operating license for the Byron Station to approximately 70 percent. (Deposition of NRC Staff witnesses, Messrs. Emmett Murphy and Jai Raj Rajan, dated July 7, 1982, Tr. 124-131 (hereinafter referred to as "Murphy/Rajan Depo. Tr. ___.")) The Staff's disposition of this ministerial matter will be reflected in a future supplement to its SER for the Byron Station. (Murphy/Rajan Depo. Tr. 126.)

Leak rate limits and in-service inspections serve to provide warnings of potential tube leaks and gross failures. (Murphy/Rajan Depo. Tr. 84-91 (leak rate limits) and 97-102 (inspections); See also para. 5 of joint affidavit of Murphy and Rajan submitted in support of the NRC Staff's motion for summary disposition.) Criteria have been established for determining when it is necessary to plug a steam generator tube because of corrosion or wear. (Murphy/Rajan

Depo. Tr. 92-96.)

Despite the foregoing measures, a steam generator tube accident has been analyzed for the Byron Station and the consequences of such an accident are well within the limits prescribed by 10 C.F.R. Part 100 (Section 15.4.3 of the SER for the Byron Station). Moreover, as a part of its activities under Task Action Plan A-3, the NRC Staff is considering generically the consequences of steam generator tube failure concurrent with other design basis accidents (Murphy/Rajan Depo. Tr. 102-104, 139, 150 and Exhibit No. 1, p. 3 and references 5 and 6). Although Contention 9c. addresses this latter accident situation (Murphy/Rajan Depo. Tr. 68-70), neither the NRC Staff's SER for the Byron Station nor the Murphy/Rajan joint affidavit which was filed in support of the Staff's motion for summary disposition address this matter. (Murphy/Rajan Depo. Tr. 139 (lines 14 and 15), 78, 80, 102-113 and 150.)

Safety evaluation reports prepared by the NRC Staff with respect to the proposed operation of a nuclear power reactor must describe those unresolved safety issues relevant and potentially significant to the facility under review and provide some explanation why operation can proceed in advance of an overall solution. (Gulf States Utility Co. (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 744 (1977).) The Staff's summary disposition motion as supported herein meets the River Bend standard established by the Atomic Safety and Licensing Appeal Board. However, this standard has not been met with respect to the single issue of the Staff's consideration of steam generator tube failure concurrent with other design basis accidents. Thus, this "genuine issue" should be set down for hearing. In all other respects, the NRC Staff is entitled to summary disposition of DAARE/SAFE Contention 9c. as a matter of law.

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## CERTIFICATE OF SERVICE

I hereby certify that copies of Commonwealth Edison Company's Answer to the NRC Staff's Motion for Summary Disposition of DAARE/SAFE Contention 9c were served on Judge's Margulies and Cole by hand-delivery and on the other persons listed below by deposit in the United States mail, first-class postage prepaid, prior to noon this 19th day of July, 1982.

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